

**REMARKS**

Claims 1-2 and 5-13 are pending. Claims 3-4 have been cancelled herein without prejudice or disclaimer. Claim 1 is amended herein. Support for the amendments is found in original claims 3-4 and as detailed below.

**Applicants' Response to the Claim Rejections under 35 U.S.C. §102(b)**

Claims 1-8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Mazed (US 6,411,642). In response thereto, applicants have amended claim 1 to more distinctly claim the subject matter regarded as the invention. Specifically, applicants have incorporated the features regarding the proximity of the groove 4 to the second supports 17b, 37b into the claim language. These added features include the isolation groove as previously described in dependent claims 3 and 4, and further defining the position of the isolation groove in relation to the second support. Mazed does not embody this feature of the current invention.

Applicants' invention pursuant to amended claim 1 is more compact than the device of Mazed since the current invention allows for the second supports to be formed directly adjacent to a groove for separating the devices. Mazed requires greater distances of surface chip area between the ridge diodes, and does not form the grooves directly adjacent to the shoulders to avoid undesirable optical, thermal, and electrical cross-talk among the lasers.

The Office Action cites to figures 1A-1C of Mazed. Figs. 1A and 1B disclose a plurality of rigid laser diode elements 10a-10d mounted on the same chip. Trenches 17 separate each of the elements from each other. This chip is "preferably inverted before being mounted on a

substrate in a module so as to improve the heat transfer.” See col. 4, lines 25-45. Fig. 1C is an expanded view of a single laser diode element. As illustrated therein, two metal shoulders 27a and 27b are on either side of the active region (ridge diode) 20. Further, the active region 20 is about 30 $\mu$ m from the metal shoulders 27a and 27b. See also col. 5, lines 12-18. Based on these teachings of Mazed, the Office maintains that the references teaches a plurality of ridges 10a-d arranged in parallel with first 27a and second 27b supports on either side, with grooves 17 formed there between, and the supports are within 20 $\mu$ m to 40 $\mu$ m of the ridge.

However, the amendment to parent claim 1 embodies the structural distinctions between the present invention and Mazed. Specifically, the trenches 17 of Mazed are required to be removed by a substantial distance from the supports 27a and 27b.

As illustrated in Figs 1a and 1c of Mazed, the trenches 17 are separate from the shoulders 27a and 27b by a substantial area of chip surface. Hence, the trenches 17 are substantially distant from individual ridge diode elements 10. Mazed specifically teaches that this is a requirement of the device as set forth at col. 5, lines 7-11 which states:

Undesirable optical, thermal, and electrical cross-talk among the lasers is minimized to some extent by physically separating the lasers by approximately 500 microns on the laser array chip and by forming isolation trenches 17 between adjacent lasers.

Therefore, based on this disclosure and Figs 1a and 1b, Mazed teaches that the trenches 17 are formed substantially distant, about 250 $\mu$ m from each active region (ridge) 20 and hence about 210 $\mu$ m from the shoulders. This is completely different from the structure of the device as set forth in the present specification and claimed in amended parent claim 1 wherein the center

groove 4 between the adjacent ridges 16, 36 is formed directly between the second supports 17b, 37b. See Fig. 1. As described in paragraph [0051] of the specification, the distance between the ridges is 110 $\mu$ m, the distance between the isolation groove 4 and the ridges 16, 36 is 55 $\mu$ m.

In light of the amendment to claim 1, applicants respectfully submit that Mazed does not teach each and every feature of applicants' claimed invention. As such, amended parent claim 1 is not anticipated under 35 U.S.C. §102.

**Applicants' Response to the Claim Rejections under 35 U.S.C. § 103**

Claims 9-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mazed (US 6,411,642) in view of Spear (US 6,075,800). As these claims depend from claim 1, applicants respectfully submit that by addressing the rejection thereof as detailed above, the rejection of claims 9-12 are likewise addressed by nature of their dependency.

In addition, applicants respectfully traverse the rejection of claims 9-12 on the basis that the feature of the claims requiring that the width ratio is less than 50% or 52% is not accounted for in the cited references. Specifically, the Office Action notes that Mazed does not teach ratios of area and widths of the supports; and therefore, cites generally to col. 4 of Spear as teaching that it is well understood in the art to adjust the size of supports in order to provide the necessary thermal conduction. However, applicants respectfully note that this recitation in the Office Action is only addressing the first requirement of the range of the claims that it is more than 33% or 44%.

In regard to the teaching of Spear, the device thereof is a ridge 14 located between two troughs 12 directly on either side. The remainder of the surface of the epitaxial material 10 is maintained at a height equal to the ridge 14. See Fig. 1. This area is equivalent to the supports. As is readily ascertainable from the figures of Spear, the device does not teach that the ratio of the support width to the chip width is less than 50% or 52%. The “support” is a majority of a surface area of the chip 1.

Contrary, the present invention maintains that the width ratio must be maintained at less than 50% or 52% so that progress of etching maybe visually monitored. As set forth in paragraph [0085] of the specification:

Since the ratio of the support width  $W_{ss}$  accounts for less than 52% relative to the chip width  $W_c$ , it is possible to ensure the monitor region for the etching of the ridge 16 and the supports 17, 17 and thus surely prevent difficulties in manufacturing the element.

The rejection set forth in the Office Action does not address this requirement of the claims, nor the motivation for keeping the ratio less than 52%. Spear, as relied upon in the rejection, does not teach this feature of the claims. Wherefore, applicants respectfully traverse the rejection on the basis that there is no teaching or suggestion provided for in the prior art to limit the ratio to less than 52%.

Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear in view of Mazed and further in view of Mitsuhashi (US 6,199,561). As the claim depends from parent claim 1, applicants respectfully submit that by addressing the rejection thereof as detailed above, the rejection of claim 13 is likewise addressed by nature of its dependency.

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Amendment  
Attorney Docket No.: 062998

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,  
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